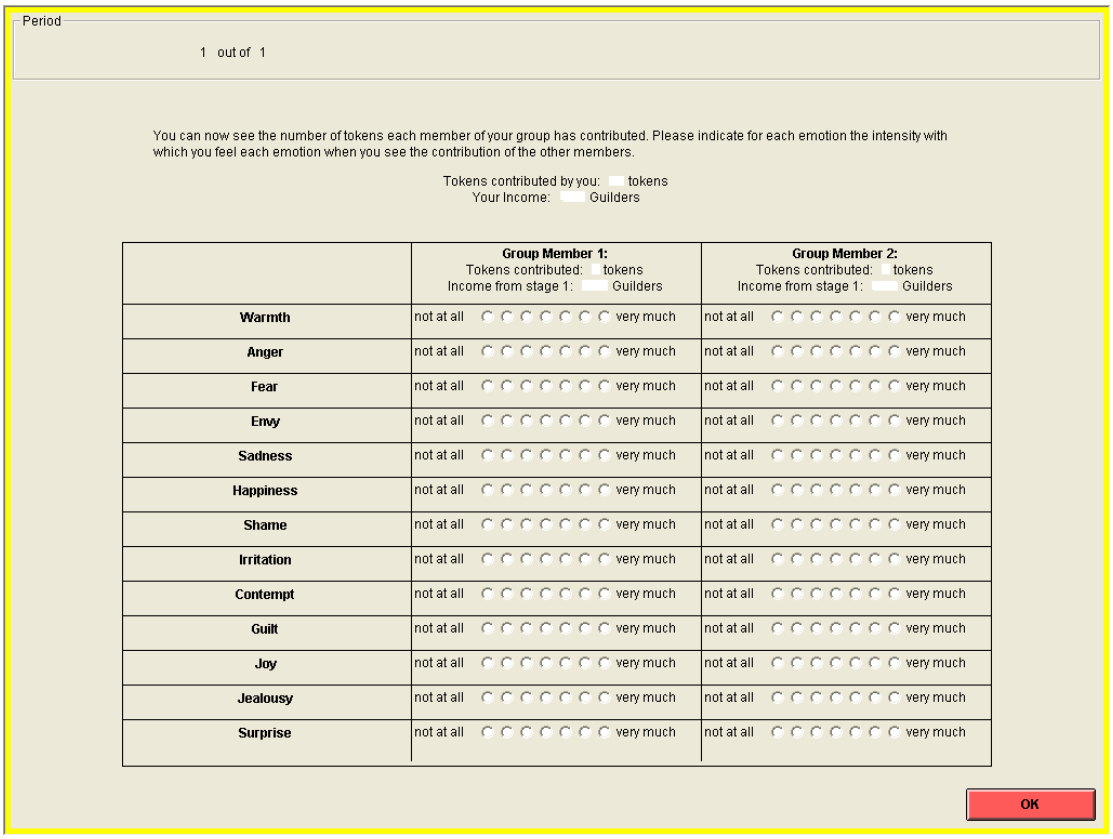
Supplementary Material to: Robin Cubitt, Michalis Drouvelis and Simon Gächter: "Framing and Free Riding: Emotional Responses and Punishment in Social Dilemma Games", *Experimental Economics*.

These supplementary materials contain three sections: Screenshots of elicited emotions (Appendix A); Experimental instructions (Appendix B) and supplementary analyses of emotions functions (Appendix C).

Appendix A – Screenshot for eliciting emotions

[Note: The screenshot for eliciting self-reports on emotions is presented below. The order of emotions was the same in all four treatments.]


Period

1 out of 1

You can now see the number of tokens each member of your group has contributed. Please indicate for each emotion the intensity with which you feel each emotion when you see the contribution of the other members.

Tokens contributed by you: tokens
Your Income: Guilders

	Group Member 1: Tokens contributed: tokens Income from stage 1: Guilders	Group Member 2: Tokens contributed: tokens Income from stage 1: Guilders
Warmth	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Anger	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Fear	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Envy	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Sadness	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Happiness	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Shame	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Irritation	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Contempt	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Guilt	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Joy	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Jealousy	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much
Surprise	not at all ○○○○○○○ very much	not at all ○○○○○○○ very much

OK

Appendix B – Experimental Instructions

[Note: These are the written instructions for the contribution stage (Stage 1) and the punishment stage (Stage 2), as presented to subjects facing the Give-P treatment. Amendments to the Stage 1 instructions for the Take and No Punishment treatments are given in square brackets and curly brackets, respectively. Apart from the first sentence, Stage 2 instructions were the same across Give-P and Take-P treatments. These instructions were not applicable to the No Punishment treatments. Screenshots are as for the Give treatments; those for the Take treatments were amended accordingly, for example replacing the word 'contribute' with 'withdraw'.]

Instructions

You are now taking part in an economic experiment financed by the University of Nottingham. You can earn a considerable amount of money depending on the decisions made by you and other participants. It is therefore very important that you read these instructions with care.

These instructions are solely for your private use. **It is prohibited to communicate with other participants during the experiment.** If you have any questions, please ask me. If you violate this rule, you will be dismissed from the experiment and forfeit all payments.

During the experiment we will not speak in terms of Pounds, but in Guilders. During the experiment your entire earnings will be calculated in Guilders. At the end of the experiment the total amount of Guilders you have earned will be converted to Pounds at the following rate:

1 Guilder = 0.40 Pounds

At the end of the experiment your entire earnings from the experiment will be paid to you **in cash**.

During the experiment, you will be asked to fill in a few questionnaires. The answers you provide in these questionnaires are completely anonymous. They will not be revealed to anyone either during the experiment or after it. Furthermore, your answers to these questionnaires will not affect your earnings during the experiment.

At the beginning of the experiment, all participants will be randomly divided into groups of three. Apart from you, there will be two more members in your group. **You will not learn who the other people in your group are at any point.**

The experiment consists of two stages {one stage}. In the following pages we describe the experiment in detail. At the end of this introductory information we ask you to do several computerised control exercises, which are designed to check that you have understood the decision situation.

Detailed Information on the Experiment

Stage 1

Each participant receives an endowment of **20 tokens** [There are **60 tokens** in a project for your group]. At stage 1, you have to decide how many of these 20 tokens you contribute to a group project and how many you keep for yourself. [At stage 1, you have to decide how many of these 60 tokens you withdraw from the project for yourself and how many of them you leave in the project]. The two other members of your group have to make the same decision. They can also either contribute tokens to a project or keep tokens for themselves. [They can also either withdraw tokens from the project for themselves or leave tokens in the

project]. You and the other members of the group can each choose any amount between 0 and 20 tokens to contribute [withdraw].

Every token that you do not contribute to [withdraw from] the project automatically belongs to you and earns you one Guilder.

For the tokens contributed to [that are not withdrawn from] the project the following happens: **the project's value will be multiplied by 1.5 and this amount will be divided equally among all three members of the group.** For example, if 1 token is contributed to [is not withdrawn from] the project, the project's value increases to 1.5 Guilders. This amount is divided equally among all three members of the group. Thus every group member receives 0.5 Guilders.

Your income from the project rises by 0.5 Guilders if you contribute [withdraw] one token more to [less from] the project. At the same time, the income of the other two members of the group also rises by 0.5 tokens, because they receive the same income from the project as you do. Therefore, if you contribute [withdraw] one token more to [less from] the project, the income from the project received by the whole group together increases by 1.5 Guilders. It is also true that your income rises by 0.5 Guilders if another group member contributes [withdraws] one token more to [less from] the project.

After all three members of the group have made their decisions about the amounts of tokens they contribute to [withdraw from] the project the total income achieved by each participant is determined.

How is your income calculated from your decision?

The income of every member of the group is calculated in the same way. As you can see, your **income** consists of two parts:

(1) The tokens which you have kept [withdrawn] for yourself ('income from tokens kept') ['income from tokens withdrawn'] whereby **1 token = 1 Guilder**.
(2) The 'income from the project' calculated as follows: **Your income from the project = 0.5 *times* sum of all tokens contributed to the project by members of your group [0.5 *times* (60 – sum of all tokens withdrawn from the project by members of your group)].**

Your **total income in Guilders at stage 1 of the experiment** is therefore:

(20 – tokens contributed to the project by you) + 0.5*(sum of all tokens contributed to the project by members of your group)
[(Tokens withdrawn from the project by you) + 0.5*(60 – sum of all tokens withdrawn from the project by members of your group)]

If you do not contribute anything to [withdraw all 20 tokens from] the project the income from tokens kept [withdrawn] is 20. If you contribute [leave] for instance 7 tokens to the project your income from tokens kept [withdrawn] is 13. At the same time, the total sum of tokens contributed to [left in] the project increases and so does your 'income from the project'.

In order to explain the income calculation we give some examples. Please read them carefully:

Example 1:
If each of the three members of the group contributes 0 tokens to [withdraws 20 tokens from] the project, all three will receive an 'income from tokens kept [withdrawn]' of 20. Nobody receives anything from the project, because no one contributed [left] anything. Therefore the total income of every member of the group is 20 tokens.
*Calculation of the income from stage 1 for every participant: (20-0) + 0.5 * (0) = 20*
[*Calculation of the income from stage 1 for every participant: (20) + 0.5 * (60-60) = 20*]

Example 2:
If each of the three members of the group contributes 20 [withdraws 0] tokens, there will be a total of 60 tokens contributed to [left in] the project. The 'income from tokens kept [withdrawn]' is 0 for everyone, but each member receives an income from the project of 0.5 * 60 = 30 tokens.
*Calculation of the income from stage 1 for every participant: (20-20) + 0.5 * (60) = 30*
[*Calculation of the income from stage 1 for every participant: (0) + 0.5 * (60-0) = 30*]

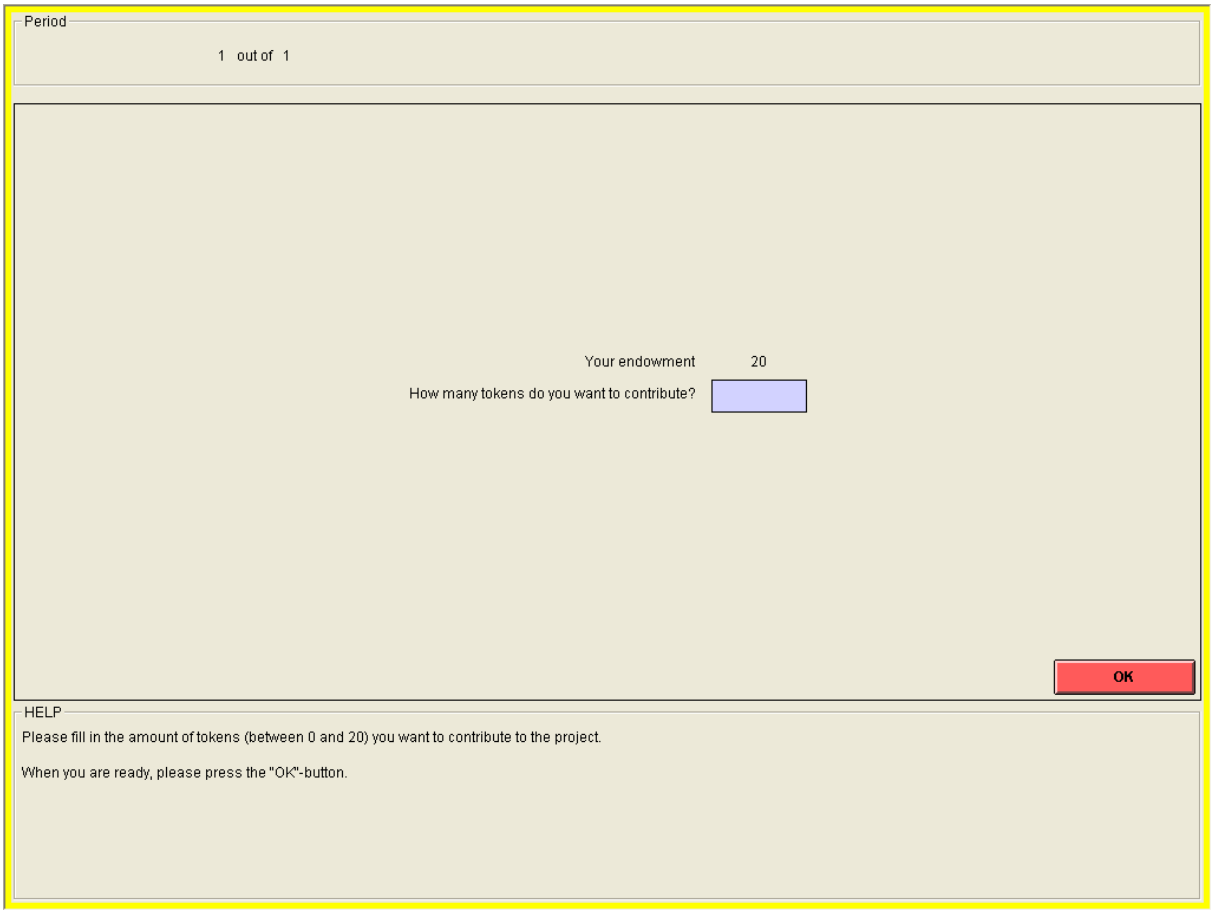
Example 3:
If you contribute 20 [withdraw 0] tokens, the second member 10 tokens and the third 0 [20] tokens, the following incomes are calculated.

- Because you and the second member of the group have together contributed [withdrawn] 30 tokens, everyone will receive 0.5 * 30 = 15 Guilders from the project.
- You contributed all your 20 tokens to [withdrew 0 tokens from] the project. You will therefore receive 15 Guilders in total from the project.
- The second member of the group also receives 15 Guilders from the project. In addition, he receives 10 Guilders as the 'income from tokens kept [withdrawn]', because he contributed [withdrew] 10 tokens to [from] the project. Thus, he receives 15 + 10 = 25 Guilders altogether.
- The third member of the group, who did not contribute anything [withdrew all tokens], also receives the 15 Guilders from the project and additionally the 20 Guilders from the 'income from tokens kept [withdrawn]', which means 20 + 15 = 35.

*Calculation of your income from stage 1: (20-20) + 0.5 * (30) = 15*
*Calculation of the income from stage 1 for the 2nd group member: (20-10) + 0.5 * (30) = 25*
*Calculation of the income from stage 1 for the 3rd group member: (20-0) + 0.5 * (30) = 35*
[*Calculation of your income from stage 1: (0) + 0.5 * (60-30) = 15*
*Calculation of the income from stage 1 for the 2nd group member: (10) + 0.5 * (60-30) = 25*
*Calculation of the income from stage 1 for the 3rd group member: (20) + 0.5 * (60-30) = 35*]

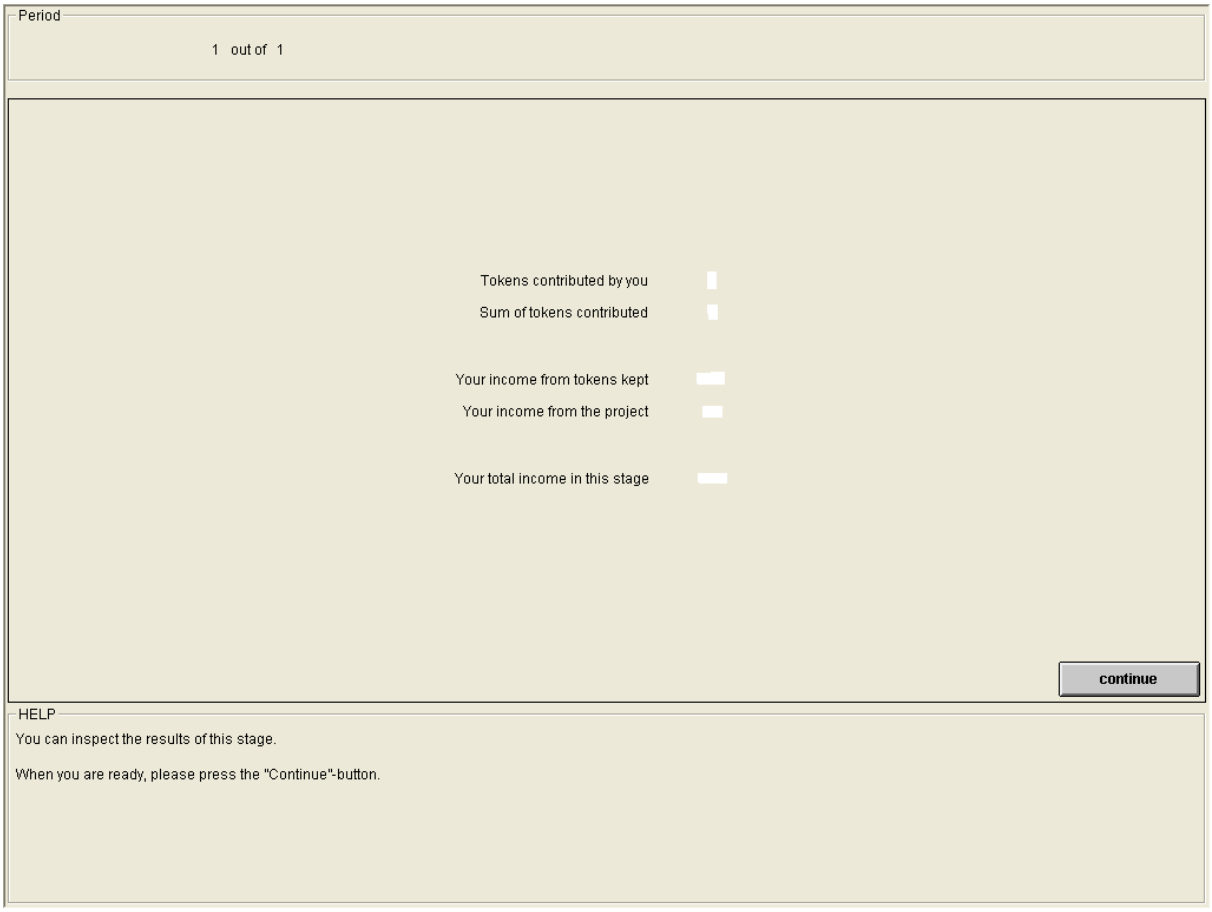
Example 4:
The two other members of your group contribute 20 [withdraw 0] tokens each to [from] the project. You do not contribute anything [withdraw all tokens]. In this case the income will be calculated as follows:
*Calculation of your income from stage 1: (20-0) + 0.5 * (40) = 40*
*Calculation of the income from stage 1 for the 2nd group member: (20-20) + 0.5 * (40) = 20*
*Calculation of the income from stage 1 for the 3rd group member: (20-20) + 0.5 * (40) = 20*
[*Calculation of your income from stage 1: (20) + 0.5 * (60-20) = 40*
*Calculation of the income from stage 1 for the 2nd group member: (0) + 0.5 * (60-20) = 20*
*Calculation of the income from stage 1 for the 3rd group member: (0) + 0.5 * (60-20) = 20*]

When making your decision, the following input-screen will appear:



As mentioned above, your **endowment in the experiment is 20 tokens** [there are **60 tokens** in a project for your group]. You have to decide how many tokens you contribute to the project by typing a number between 0 and 20 in the input field [You have to decide how many of these 60 tokens you withdraw from the project by typing a number between 0 and 20 in the input field]. This field can be reached by clicking it with the mouse. By deciding how many tokens to contribute to [withdraw from] the project, you automatically decide how many tokens you keep for yourself [you leave in the project]. After entering the amount of tokens you contribute [withdraw] you must press the O.K. button using the mouse. Once you have done this, your decision can no longer be revised.

After that, you will be informed about the amount of tokens contributed to [withdrawn from] the project by you, the sum of tokens contributed to [withdrawn from] the project and your total income in this stage.

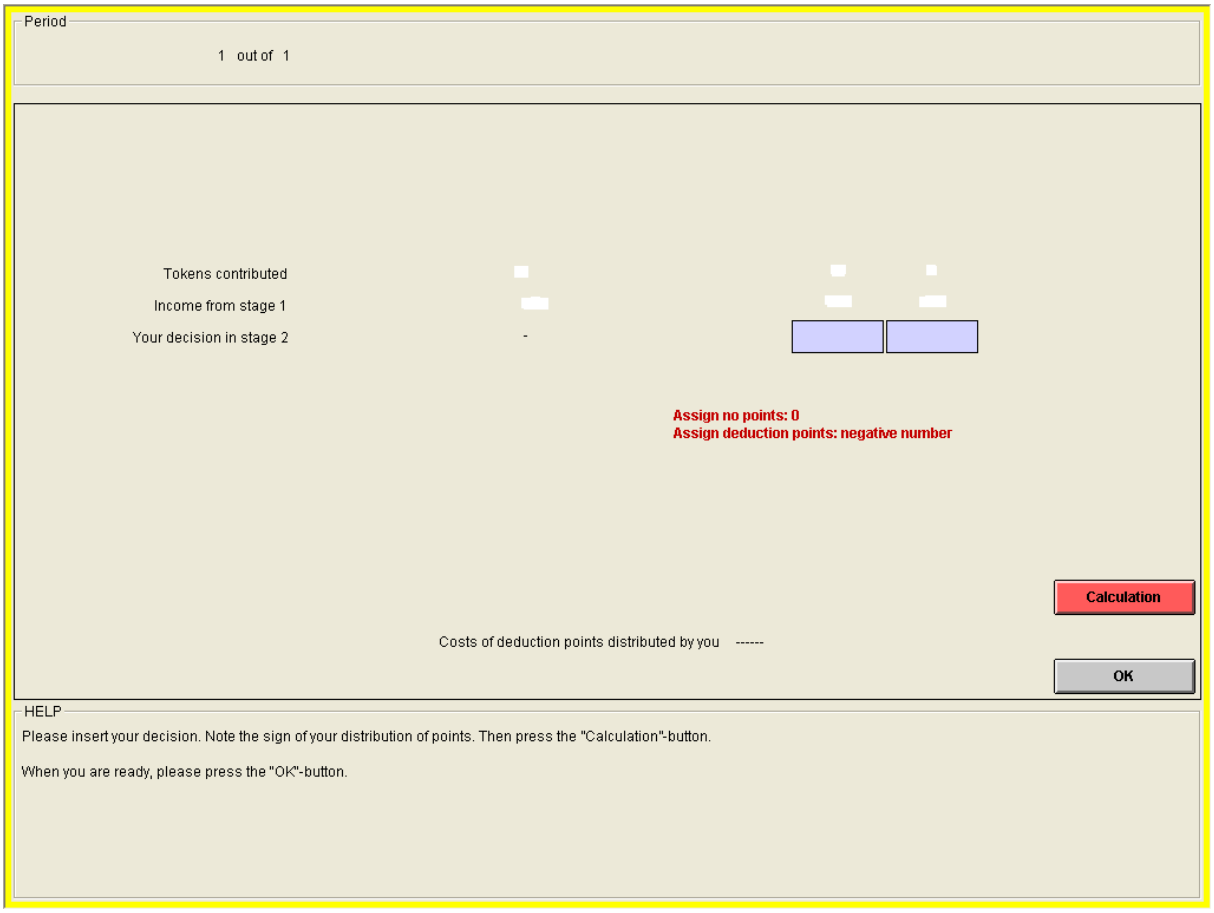


Stage 1 is now over and stage 2 commences.

Stage 2

At this stage, you will see how many tokens each of the other two group members has contributed to [withdrawn from] the project and his or her corresponding income from stage 1. Moreover, you can either **decrease** or **leave unchanged** the income of each other group member by assigning **deduction points** to them. The other group members can also decrease **your** income, by assigning deduction points to you, if they wish to do so.

You will see the following input screen at stage 2:



You must now decide how many deduction points to assign to each of the other two group members. In the first column you can see your contribution [withdrawal] and your income from stage 1. In the other two columns, you can see the same information for each of the two other members of the group.

If you do not wish to change the income of a specific group member then enter 0 in the large box for that group member. If you do wish to reduce a group member's income, enter instead the number of deduction points that you wish to assign to them, preceded by minus sign (without spaces between them). For example, to assign 2 deduction points to a group member, type -2 in the relevant box. You can move from one input field to the other by pressing the tab -key ($\rightarrow|$) or by using the mouse. You must enter a response in each large box.

You can assign **between 0 and 5 deduction points to each other group member**.

For each deduction point that you assign, there is a cost to you of one Guilder. Thus, the total cost to you in Guilders of assigning deduction points to other group members is given by the total number of deduction points that you assign. You can check the total cost on the computer, by pressing the '**Calculation**' button after you have assigned deduction points. Until you press the **OK-button**, you can still change your decision. To recalculate the costs after making a change, simply press the cost calculation button again.

The effects of assigning deduction points to other group members are as follows: If you give 0 points to a particular group member, you will not have any effect on his or her income.

However, **for each deduction point that you assign to a particular group member, you will decrease their income by 2 Guilders** (unless their income is already exhausted). For example, if you give a group member 2 deduction points (i.e., enter –2), you will decrease their income by 4 Guilders. And so on.

Your own income will be reduced by 2 Guilders for each deduction point that is assigned to you by the other two group members, except that, if all of your income from the first stage is exhausted as a result of deduction points, your income cannot be reduced any further by other group members. Therefore, your total income from the two stages is calculated as follows:

Total income (in Guilders) after stage 2

= income from stage 1 (1)
– 2*(sum of deduction points assigned to you) (2)
– costs of deduction points assigned by you

if (1) + (2) is greater than or equal to 0;

= **0** – costs of deduction points assigned by you

if (1) + (2) is less than 0

Please note that your income in Guilders after stage 2 can be negative, if the cost of deduction points assigned by you exceeds your income from stage 1 less any reduction in your income caused by deduction points assigned to you by other group members.

However, at the end of the experiment and in addition to the calculation just given, you and the other members of your group will each receive a lump sum payment of **10 Guilders.** This payment is enough to cover any losses that you could incur**.**

Do you have any questions?

Appendix C: Table C1

Table C1 complements Table 5 in the main text. It reports the same analysis as in Table 5 for all elicited emotions, except anger and guilt which are reported in Table 5. The main purpose of this table is to support the claim in the paper that we find no find framing effect in any of the elicited emotions (with the exception of one interaction term for "Joy").

Table C1: Emotion function for all other elicited emotions

	Dependent variable										
	Warmth	Fear	Envy	Sadness	Happiness	Shame	Irritation	Contempt	Joy	Jealousy	Surprise
Player *j*'s abs. neg. dev. from *i*'s contribution	-0.085***	0.00800	0.0713***	0.0706***	-0.0577*	0.0389*	0.110***	0.0897***	-0.0574*	0.0723***	0.0397
	(0.0271)	(0.0299)	(0.0258)	(0.0258)	(0.0304)	(0.0199)	(0.0198)	(0.0276)	(0.0320)	(0.0263)	(0.0266)
Player *j*'s positive. dev. from *i*'s contribution	0.0939***	0.00770	-0.0495*	0.0473**	0.0940***	0.0676***	-0.087***	-0.00286	0.107***	-0.0398	0.134***
	(0.0262)	(0.0216)	(0.0284)	(0.0215)	(0.0265)	(0.0171)	(0.0282)	(0.0198)	(0.0221)	(0.0293)	(0.0203)
Player *k*'s contr. dev. from *i*'s contribution	-0.0121	0.0275**	0.0200*	-0.0109	0.00287	-0.00200	0.0167*	0.00728	-0.00018	0.0299***	0.000941
	(0.00917)	(0.0109)	(0.0107)	(0.00973)	(0.00797)	(0.0112)	(0.00853)	(0.00721)	(0.00901)	(0.0111)	(0.00885)
Take	-0.191	-0.0483	-0.277	-0.0848	0.153	-0.187	-0.182	-0.134	0.153	-0.138	-0.209
	(0.223)	(0.241)	(0.242)	(0.232)	(0.197)	(0.206)	(0.184)	(0.189)	(0.206)	(0.262)	(0.184)
Take × Player *j*'s abs. neg. dev. from *i*'s contribution	0.0280	0.0541	0.0627	0.0111	-0.0292	-0.0173	0.0504	0.0144	-0.0267	0.0610	0.0506
	(0.0529)	(0.0410)	(0.0464)	(0.0441)	(0.0375)	(0.0351)	(0.0452)	(0.0397)	(0.0418)	(0.0466)	(0.0383)
Take × Player *j*'s positive. dev. from *i*'s contribution	0.0249	-0.0265	0.0114	-0.0367	-0.0364	-0.0530	0.00613	-0.00595	-0.056**	-0.0547	-0.0151
	(0.0312)	(0.0353)	(0.0415)	(0.0315)	(0.0333)	(0.0331)	(0.0432)	(0.0308)	(0.0270)	(0.0509)	(0.0334)
No Punishment	-0.0108	-0.148	-0.112	0.333**	-0.0228	0.155	-0.124	0.143	0.0557	-0.370**	0.160
	(0.151)	(0.160)	(0.149)	(0.151)	(0.144)	(0.144)	(0.138)	(0.146)	(0.145)	(0.150)	(0.125)
Observation	336	336	336	336	336	336	336	336	336	336	336

Notes: Ordered probit estimates. Standard errors are presented in parentheses (clustered on individuals). Results are corrected for heteroskedasticity. ** denotes significance at the 5-percent level, and *** at the 1-percent level.